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INVENTORY OF RESEARCH PROJECTS 1975-76

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1976

Ministry of the Environment

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The Honourable
George A. Kerr, Q.C.,
Minister

Everett Biggs,
Deputy Minister

Date Due

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PREFACE

The Inventory of Research Projects is produced by the Research Advisory Committee with the assistance of staff of the Development and Research Group. Any questions concerning specific projects should be addressed to the Director of the Branch which initiated the study.

Paul D. Foley,
Chairman,
Research Advisory Committee

INVENTORY OF RESEARCH PROJECTS

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INTRODUCTION

ORIGIN OF THE PROJECT

The Ministry first published an inventory of research and development projects in June 1973. The publication was initiated by the Deputy Minister who recognized the need for a comprehensive list of research and development projects which would be readily available to all agencies. The initial report was prepared by the Strategic Planning Branch. The Research Advisory Committee was appointed during the past year and is now responsible for it.

PURPOSE

The purpose of this report is to promote the communication of this Ministry's activities to the research community, and to facilitate a more efficient use of capital and human resources devoted to environmental research. It is hoped that the information contained here will assist those currently conducting studies, by providing them with access to projects in this Ministry which are related to their own. Another major objective is to foster co-operative efforts and prevent the duplication of programmes, particularly among Ministries of the Ontario Government. Ultimately, the inventory and successive updates will provide a comprehensive background for the selection of environmental research priorities, revealing those areas which are already being extensively examined, and those which demand increased attention.

ORGANIZATION OF THE INVENTORY

The report consists of profiles of the individual research projects being conducted by each Branch of the Ministry in the (1975-76) fiscal year, as they were identified by the Branches themselves. It includes in-house activity, as well as grants to Universities and contract research.

Since a dictionary definition of research - "investigation aimed at the discovery of facts or principles" - is so general as to include some elements of almost every operation of this Ministry, certain limits were established to the terms of reference of this report. The inventory includes:

(1) all projects conducted outside the Ministry, through Ministry of the Environment funding;

(2) all research carried out by the Ministry's Branches where the annual budget of the projects were in excess of $7,500 and/or ½ man year.

It is outside the objectives of the inventory to include the routine test series and studies which implement on-going management programmes etc.

EXPLANATION OF TABLES

The statistical tables found at the end of this introduction are drawn directly from the information presented in the profiles. Figures are broken down by Branch, and aggregated to reflect the Ministry activity as a whole. Where separate projects are grouped as a set in the report, but distinct budgets and durations are supplied, each component is identified separately in the computations. Budgets and durations are tabulated as the information was received; however, because of the absence, in the Ministry, of any standard system of identifying and accounting for resources devoted to research, statistics derived from these profiles can only claim to demonstrate the general direction and contours of the programme.

TABLE 1

Table 1 gives the total number of research projects reported for each Branch. This total is broken down to demonstrate the way in which each Branch employs the funds it allocates to research. Approximately 46% of the projects are conducted in-house; the balance are either contracts or grants to Universities. There is, however, a disparity among the Branches; only three utilize research contracts and two grant programmes.

Table 1 also indicates that, overall, about 30% of the projects involve some co-operation with other Ontario Ministries, Federal Government Agencies, municipalities, etc. In some cases the effort is a joint undertaking throughout; in others, the co-operating agency contributed samples, or facilities, to a Ministry of the Environment project.

TABLE 11

Table 11 reflects the research budgets of the various Branches in 1975-76, and shows whether funds are concentrated on a few major projects, or divided among many smaller ones.

In some cases, the project necessitated purchase of capital equipment; this expenditure is included in determining the project value. The totals represent the sum of dollar figure budgets and those converted from valuation in man-months. The table shows that 33% require $10,000 or less, another 55% from $10,000 to $50,000 and 12% exceed $50,000 in budget.

FORMAT

The projects are grouped under their funding Branches. The profiles supply the following information:

Branch	*Ministry branch responsible for the project; contact for further information.*
Project Title	*For identification and filing.*
Principal Investigator	*Contact for additional information on project.*
Liaison Officer Supervisor or/ Senior Ministry Official	*Responsible for the project.*
Research Category	*Identifies whether work done in Ministry (internal) or outside (grant or a solicited or unsolicited contract) and if project is multi-year and if concurrent to a second related project.*
Objective	*Immediate reasons for undertaking the project.*
Description	*Details of the projects focuses on the methodology employed and indicates the exact nature of the research to persons with expertise in the field. Where a set of projects have been grouped under one title, the individual projects receive separate treatment under the "Description" heading and thereafter.*
Starting and Completion Dates	*Duration of project.*
Budget	*Current year total dollars and man years for the project. These are estimates only.*

Source of Funds	*Projects in the regular work programme are funded out of normal branch budgets, those in the special category use funds set up particularly for the project and are identifiable in the Ministry budget. Most of the jointly funded projects are federal-provincial programmes such as, International Joint Commission and Canada-Ontario Agreement.*
Reporting Procedure	*Whether there will be interim and/or final reports available; and when anticipated.*

TABLE 1 BRANCH	TOTAL NUMBER OF PROJECTS	Number Of Research Projects By Type			PROJECTS WITH CO-OPERATING OUTSIDE AGENCIES
		In-House	Grant	Contract	
LABORATORY SERVICES	5	5	-	-	-
POLLUTION CONTROL	34	14	-	20	12
WATER RESOURCES	19	16	-	3	13
AIR RESOURCES	25	4	21	-	-
ENVIRONMENTAL APPROVALS	1	1	-	-	-
RESOURCE RECOVERY	2	-	1	1	1
TOTAL	86	40	22	24	26

TABLE 11

BRANCH	RESEARCH PROJECTS BY DOLLAR VALUE			TOTALS
	7,500-10,000	10,000-50,000	> 50,000	
LABORATORY SERVICES	1	4	-	5
POLLUTION CONTROL	20	13	1	34
WATER RESOURCES	1	9	9	19
AIR RESOURCES	4	17	-	21
ENVIRONMENTAL APPROVALS	-	1	-	1
RESOURCE RECOVERY	1	1	-	2
TOTALS	27	45	10	82

AIP

RESOURCES

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 29, 1975

PROJECT TITLE Development of Air Quality Criteria Based on Vegetation Effects

KEY WORDS Air Quality Criteria, Ethylene, Sodium Sulphate, Combination of Sulphur Dioxide and Ozone

PRINCIPAL INVESTIGATOR AND AFFILIATION D.B. Drummond, P.J. Temple, R. Richards and G.M. Vasiloff, Phytotoxicology Section

LIAISON OFFICER OR SUPERVISOR S.N. Linzon, Supervisor, Phytotoxicology Section

RESEARCH CATEGORY INTERNAL X GRANT UNSOLICITED SOLICITED MULTI-YEAR CONCURRENT

OBJECTIVE See next page

DESCRIPTION See next page

STARTING DATE 1975

COMPLETION DATE
1) Ethyelene - two years
2) Sodium sulphate - one year
3) Sulphur Dioxide & Ozone - three years

BUDGET CURRENT YEAR

MAN YEARS
1) 300 hours)
2) 50 hours) 1/3 man year
3) 300 hours)

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE Progress and Final Reports submitted to Supervisor. Pertinent results are forwarded to interested parties, as Criteria Development, Industrial Abatement and Approvals Sections and Industries involved.

REMARKS

PROJECT TITLE Development of Air Quality Criteria Based on Vegetation Effects

OBJECTIVE

1) Ethylene - to determine if projected amounts of ethylene from a polyethylene plant will injure crops, flowers, and indigenous vegetation in the vicinity.

2) Sodium sulphate - to determine the effects of aerial and soil applications of sodium sulphate on bean and tomato plants

3) Sulphur Dioxide & Ozone - to determine the effects of both SO_2 and O_3 on white ash.

DESCRIPTION

1) Ethylene - Plant species raised in the phytotoxicology greenhouse to various stages of growth will be exposed under controlled environment conditions to different concentrations of ethylene in various time periods.

2) Sodium Sulphate - Sodium sulphate is applied as a dust at various concentrations and frequencies to the moistened leaves and soil of potted bean and tomato plants. Growth is determined by plant height, leaf-length and dry weight measurements.

3) Sulphur Dioxide and Ozone - White ash seedlings will be exposed to various concentrations and combinations of SO_2 and O_3 in varying time periods under controlled environment conditions.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 29, 1975

PROJECT TITLE: Effects of Heavy Metal Uptake on Plants Growing in Contaminated Soil

KEY WORDS: Heavy Metals, Uptake, Plant growth, Contaminated soils

PRINCIPAL INVESTIGATOR AND AFFILIATION: P.J. Temple, R.G. Pearson, A.W. Hill, D.B. Drummond and D. Balsillie, Phytotoxicology Section and Northeast Region

LIAISON OFFICER OR SUPERVISOR: S.N. Linzon, Supervisor, Phytotoxicology Section

RESEARCH CATEGORY: INTERNAL X | GRANT | UNSOLICITED | SOLICITED | MULTI-YEAR | CONCURRENT

OBJECTIVE

See next page

DESCRIPTION

See next page

STARTING DATE: 1975

COMPLETION DATE: Lead, etc. - 2 months; Hg & Ag - one year; Ni & Cu - three years

BUDGET CURRENT YEAR

MAN YEARS: 1) 40 hours) 2) 100 hours) 1/3 man year 3) 500 hours)

SOURCE OF FUNDS: REGULAR WORK PROGRAM X | SPECIAL MINISTRY FUNDING ___ | JOINTLY FUNDED PROJECT ___ | OTHER ___

REPORTING PROCEDURE: Progress and Final Reports submitted to Supervisor, Pertinent results are forwarded to interested parties, as Criteria Development, Industrial Abatement and Approvals Sections and Industries involved.

REMARKS

PROJECT TITLE Effects of Heavy Metal Uptake on Plants Growing in Contaminated Soil

OBJECTIVE

1) Lead, Arsenic, Cadmium & Zinc - to determine the growth rate of tomato, radish, lettuce and bean in soil contaminated by heavy metals collected immediately adjacent to secondary lead industries

2) Mercury & Silver - to determine the growth rate of beets in soil contaminated by mercury & silver.

3) Nickel, Copper & Iron - to determine the growth rate of plants in soil contaminated by heavy metals collected in the vicinity of nickle and copper smelters, and to determine the effects of various soil amelioration treatments.

DESCRIPTION

1) Lead, Arsenic, Cadmium & Zinc - tomato, lettuce, radish and bean seeds are germinated in a close system of high lead soil, and growth rate of the plants are measured. The soil and plant parts are analyzed for heavy metal uptake.

2) Mercury & Silver - beets will be grown in contaminated and uncontaminated soil at two sites located close to a source of mercury and silver and in a control location. All plants will be harvested, measured and chemically analyzed at the end of the growing season.

3) Nickel, Copper, Iron - Indigenous and garden type plant species will be grown in contaminated soils from the Sudbury area and the plants will be evaluated for growth, yield, symptom development and chemical content following the use of several soil amelioration treatments.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 29, 1975.
PROJECT TITLE	Vegetation Response to Interactions between Air Pollutants and other Agents
KEY WORDS	Interactions, Air Pollutants, Peach stem canker, Maple leaf gall, Tobacco virus, Road Dust
PRINCIPAL INVESTIGATOR AND AFFILIATION	D.S. Harper, P.J. Temple, S. Bisessar and G.N. Vasiloff, Phytotoxicology Section
LIAISON OFFICER OR SUPERVISOR	S.N. Linzon, Supervisor, Phytotoxicology Section

RESEARCH CATEGORY			
INTERNAL GRANT	X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE — See next page

DESCRIPTION — See next page

STARTING DATE	1975	COMPLETION DATE	1) Peach stem canker - two years 2) Maple leaf gall - 1 1/2 years 3) Tobacco mosaic virus - 1 year 4) Road dust - three years
BUDGET CURRENT YEAR		MAN YEARS	1) 200 hrs.) 2) 100 hrs.) 3) 100 hrs.) 4) 200 hrs.) 1/3 man years

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE — Progress and Final Reports submitted to Supervisor. Pertinent results are forwarded to interested parties, as Criteria Development, Industrial Abatement and Approvals Sections and Industries involved.

REMARKS

PROJECT TITLE Vegetation Response to Interactions between Air Pollutants and other Agents

OBJECTIVE

1) Peach stem canker - to determine if fluorides increase or decrease the severity of the peach stem canker disease (Leucostoma cincta and L. persoonii).

2) Maple leaf gall - to study the interaction between fluoride contamination and the incidence of a gall-forming mite on foliage of silver maple trees.

3) Tobacco mosaic virus - to determine if atmospheric ozone suppresses or enhances virus diseased tobacco under field conditions

4) Road dust - to determine the effectiveness of road dust in protecting vegetation from sulphur dioxide and ozone pollution injury.

DESCRIPTION

1) Peach stem canker - vegetative and reproductive structures of the disease fungi are subjected to elevated fluoride concentrations in vivo and in vitro.

2) Maple leaf gall - silver maple trees in the vicinity of a source of HF will be periodically sampled and the average number of galls per leaf will be determined. This will be related to the amount of fluoride in the leaf tissue, as determined by chemical analysis, and distance from the source.

3) Tobacco mosaic virus - a commercial variety of tobacco which is susceptible both to ozone fleck and artificial inoculations of tobacco mosaic virus will be maintained until maturation in the field near an ozone monitoring station. Fifty percent of these plants will be inoculated with the virus.

4) Road dust - laboratory experiments using processed road dust applied to leaf surfaces of buckwheat and pinto bean plants and exposed to various concentrations of sulphur dioxide and ozone under controlled environment conditions.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 29, 1975

PROJECT TITLE Air Pollution Effects on Vegetation to Complement Assessment Surveys in Vicinity of Industrial Sources

KEY WORDS Effects, Arsenic, Black liquor, Boron, Fluoride, Mercury, Peroxyacetyl nitrate

PRINCIPAL INVESTIGATOR AND AFFILIATION D.B. Drummond, P.J. Temple, P.G. Pearson, A.W. Hill and D.S. Harper, Phytotoxicology Section

LIAISON OFFICER OR SUPERVISOR S.N. Linzon, Supervisor, Phytotoxicology Section

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE See next page

DESCRIPTION See next page

STARTING DATE 1975

COMPLETION DATE

1) Arsenic - three years
2) Black liquor - two months
3) Boron - three months
4) Fluoride - two years
5) Mercury - one year
6) Peroxyacetyl nitrate - two years

BUDGET CURPENT YEAR

MAN YEARS

1)	500 hrs.)	
2)	60 hrs.)	1/3 man year
3)	40 hrs.)	
4)	100 hrs.)	
5)	100 hrs.)	1/4 man year
6)	200 hrs.)	

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Progress and Final Reports submitted to Supervisor. Pertinent results are forwarded to interested parties, as Criteria Development, Industrial Abatement and Approvals Sections and Industries involved.

REMARKS

PROJECT TITLE: Air Pollution Effects on Vegetation to Complement Assessment Surveys in Vicinity of Industrial Sources

OBJECTIVE

1) Arsenic - to determine the response of different plant species to artificial fumigations with airborne and soil applied arsenic.

2) Black liquor - to determine the effects of black liquor and black liquor-sodium sulphate applications to bean and tomato plants.

3) Boron - to determine the relative amounts of boron absorbed by plants from contaminated soil and from the air in the vicinity of a boron source.

4) Fluoride - to explain occurrence of high levels of fluoride in forage in late growing season in the vicinity of fluoride sources.

5) Mercury - to differentiate between foliar uptake of airborne mercury emissions from a mercury source and those that could be vaporized from contaminated soil in the vicinity of the company.

6) Peroxyacetyl nitrate - to compare the sensitivity of several tomato varieties to artificial exposures of PAN with the sensitivity as observed under field conditions in SW Ontario.

DESCRIPTION

1) Arsenic - several plant species will be treated with compounds of arsenic at different concentrations and for different exposure periods in controlled environment greenhouse and growth chambers.

2) Black liquor - pinto bean and veemore tomato plants are treated with balck liquor under varying conditions in controlled environment greenhouse.

3) Boron - gladiolus plants are being grown under the following conditions:

 a) in contaminated soil adjacent to source
 b) in pots(containing uncontaminated soil) adjacent to source
 c) in contaminated soil in filtered air
 d) in uncontaminated soil in a control location

4) Fluoride - fluoride data from monthly collections of forage near three companies: an HF manufacturer, a fertilizer plant and a brickwork in conjunction with indicator grasses grown in contaminated and uncontaminated soil will be examined.

5) Mercury - tomato plants will be grown in mercury contaminated and uncontaminated soils in perforated plastic chambers under various treatments.

6) Peroxyacetyl nitrate - several tomato varieties will be exposed to known concentrations of PAN in controlled environment plant fumigation chambers.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE Calibration of the Lidar for Monitoring Atmospheric Particulates (05-75)

KEY WORDS Lidar, Atmospheric - Particulates, Particle Sampling

PRINCIPAL INVESTIGATOR AND AFFILIATION D.R. Hay, Dept. of Physics, University of Western Ontario

LIAISON OFFICER OR SUPERVISOR S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal

RESEARCH CATEGORY					
INTERNAL GRANT	X	UNSOLICITED SOLICITED		MULTI-YEAR CONCURRENT	X

OBJECTIVE

1) To examine the sources of uncertainty in the measurement of atmospheric particulate concentration by lidar.
2) To establish the limits of uncertainty in measurements by lidar.

DESCRIPTION

1) An error analysis will be carried out on the lidar equation.
2) More extensive lidar observations will be made simultaneously with direct particle sampling.

STARTING DATE June 16, 1975 COMPLETION DATE March 31, 1976

BUDGET CURRENT YEAR $10,000.00 MAN YEARS

SOURCE OF FUNDS							
REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS Fourth year of a proposed 4-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	High Resolution Spectroscopic Studies on Daylight Atmospheric Absorption over the Toronto Region with Specific Application to the Elucidation of the Brown Atmospheric Haze (06-75).
KEY WORDS	Spectroscopic Studies, Atmospheric Absorption, Brown Atmospheric Haze
PRINCIPAL INVESTIGATOR AND AFFILIATION	R.W. Nicholls, CRESS, York University
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technical Development & Appraisal Section

RESEARCH CATEGORY				
INTERNAL GRANT	X	UNSOLICITED SOLICITED		MULTI-YEAR CONCURRENT

OBJECTIVE

1) To make high resolution spectroscopic observations of the absorption properties of the atmosphere.

2) To elucidate the cause of the "Brown Haze".

DESCRIPTION

1) Experimental: Using a 21 foot Eagle-mounted grating spectrograph-spectrometer to measure atmospheric light absorption.

2) Theoretical: Using "SPECT 3" a powerful computational pool, to interpret the spectroscophic observations.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$14,550.00	MAN YEARS	

SOURCE OF FUNDS						
REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	Demonstration of Mass Spectrometry for the Determination of Sulphur Trioxide (Sulphuric Acid) in the Presence of Sulphur Dioxide with application to Stack Gas Sampling (07-75).
KEY WORDS	Mass Spectrometry, Sulphur Trioxide, SO_2, Stack Gas Sampling
PRINCIPAL INVESTIGATOR AND AFFILIATION	P.L. Silveston, Dept. of Chemical Engineering, University of Waterloo.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT X	SOLICITED	CONCURRENT

OBJECTIVE

1) To demonstrate the use of Mass Spectrometry for the routine measurement of SO_3 in the presence of SO_2.

2) To demonstrate the use of Mass Spectrometry for measuring the concentration of SO_3 and SO_2 in a gas sample.

DESCRIPTION

Demonstration of the use of mass spectrometry with SO_3/SO_2 mixtures with attention to stability, calibration, adsorption and condensation of SO_3 and corrosion.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$7,950.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE Detection of SO_2 and H_2S Using Laser Absorption Techniques (09-75)

KEY WORDS SO_2, H_2S, Laser Absorption, Infrared Atmospheric Monitoring.

PRINCIPAL INVESTIGATOR AND AFFILIATION E. Brannen,
Department of Physics,
University of Western Ontario.

LIAISON OFFICER OR SUPERVISOR S. Stevens, Head, Special Studies & Programme Planning Unit, Technology, Development & Appraisal Section.

RESEARCH CATEGORY			
INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR X CONCURRENT	

OBJECTIVE To develop a laser absorption system to detect SO_2 and H_2S in the air to 0.01 ppm in less than 10 meters for monitoring industries and the general air environment.

DESCRIPTION 1) Investigating the infrared laser systems and measuring absorption in absorption chambers containing the gases to be detected.

2) To design and build a working system for atmospheric monitoring.

STARTING DATE June 16, 1975 COMPLETION DATE March 31, 1976

BUDGET CURRENT YEAR $10,000.00 MAN YEARS

SOURCE OF FUNDS					
REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___		

REPORTING PROCEDURE No formal report required, except progress report in case of request for additional funding in multi-year programs.

REMARKS Continuous, 2nd year of a proposed 2-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975.
PROJECT TITLE	Remote Lidar Detection of Pollutants (10-75)
KEY WORDS	Remote Lidar Detection
PRINCIPAL INVESTIGATOR AND AFFILIATION	A.I. Carswell, Dept. of Physics, York University.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE: To assess the capabilities of lidar systems for remote measurements of atmospheric constituents.

DESCRIPTION: To utilize the lidar equipment to obtain a continuing input of new atmospheric measurement data from Toronto area.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$8,000.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: Continuous, 4th year of a proposed 4-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975.
PROJECT TITLE	Detection of Gaseous Pollutants Such as O_3, NO, NO_2, PAN by direct Path Resonance Absorption Using Lasers (11-75)
KEY WORDS	Detection of Gaseous Pollutants, O_3, NO, NO_2, PAN, Lasers, Pollution Map System, Ambient Monitoring
PRINCIPAL INVESTIGATOR AND AFFILIATION	J. Shewchun, Dept. of Engineering, Physics, McMaster University.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE

Using Lasers to (1) produce a pollution map system

(2) as a light source in long path and print ambient monitoring.

DESCRIPTION

To investigate the detection characteristics of H_2S with diode lasers.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$13,600.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Research on the Safety and Environmental Control Aspects of Flaring (13-75)
KEY WORDS	Safety, Environmental Control, Flaring, Combustion, Flame Radiation
PRINCIPAL INVESTIGATOR AND AFFILIATION	T. Brzustowski, Academic Vice-President, University of Waterloo.
LIAISON OFFICER OR SUPERVISOR	E.T. Barrow, Head, New Technology & Process Evaluation Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY							
	INTERNAL		UNSOLICITED		MULTI-YEAR	X	
	GRANT	X	SOLICITED		CONCURRENT		

OBJECTIVE: To study flame for safety and environmental purpose.

DESCRIPTION:
1) Study flame shape and length
2) Study completeness of combustion
3) Research on flame radiation

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$15,000.00	MAN YEARS	

SOURCE OF FUNDS							
	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: Continuous, 3rd year of a proposed 3-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	Trace Analysis of Compounds on Airborne Particulate Matter and Other Environmental Contaminants (15-75)
KEY WORDS	Trace Analysis, Airborne Particulate, Gas chromatograph/mass spectrometer, aerosols.
PRINCIPAL INVESTIGATOR AND AFFILIATION	F.W. Karasek, Dept. of Chemistry, University of Waterloo.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE

1) To apply gas chromatograph/mass spectrometer and other instrumentation to the trace analysis of organic compounds adsorbed on aerosols.
2) To develop practical analytical methods.

DESCRIPTION

1) Developing analytical techniques
2) Study detailed analytical work
3) Producing profile data as results.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976.
BUDGET CURRENT YEAR	$15,000.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: Continuous, 3rd year of a 3-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Atmospheric Chemical and Photochemical Reactions of Polynuclear Aromatic Hydrocarbons (17-75)
KEY WORDS	Chemical and Photochemical Reactions, Polynuclear Aromatic Hydrocarbons, Particle Size, Cascade Impactors
PRINCIPAL INVESTIGATOR AND AFFILIATION	Morris Katz York University
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT
	X		

OBJECTIVE

1) To determine the differences in distribution of polynuclear aromatic hydrocarbons with respect to particle size in various Ontario locations.

DESCRIPTION

1) Conducting studies of the second seasonal distribution of PAH in relation to particle size of aerosol particle with Andersen Cascade Impactors.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$10,000.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	Multiple Applications of the Trace Atmospheric Gas Analyzer (TAGA) System to Air Quality Measurements.
KEY WORDS	Trace Atmospheric Gas Analyzer (TAGA), Air Quality Measurements, Gas Phase, Particulates
PRINCIPAL INVESTIGATOR AND AFFILIATION	J.B. French, University of Toronto
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY					
	INTERNAL GRANT	X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT	X

OBJECTIVE: To develop a portable unit of the trace atmospheric gas analyzer which can monitor trace substances both in the gas phase and adsorbed on particulates.

DESCRIPTION: To identify SO_2, NH_3, CH_4, HNO_3 and some other trace atmospheric constituents using TAGA.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976.
BUDGET CURRENT YEAR	$11,000.00	MAN YEARS	

SOURCE OF FUNDS							
	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: 1st year of a 2-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE: Development of Methods of Nickel Recovery from Sulphide Ore Without Release of Sulphur Dioxide (23-75).

KEY WORDS: Nickel, Sulphide Ore, Sulphur Dioxide, Literature Review.

PRINCIPAL INVESTIGATOR AND AFFILIATION: C.R. Phillips, Dept. of Chemical Engineering & Applied Chemistry, University of Toronto

LIAISON OFFICER OR SUPERVISOR: E.T. Barrow, Head, New Technology & Process Evaluation, Technology Development & Appraisal Section

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE: To develop methods of extraction by nickel from sulphide ores with great reduction of SO_2

DESCRIPTION:
1) Literature review
2) Will do exploratory experiment

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$8,500.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	H_2SO_4 Aerosol Monitoring Programme (29-75)
KEY WORDS	H_2SO_4 Aerosol Monitoring
PRINCIPAL INVESTIGATOR AND AFFILIATION	S.C. Barton, Dept. of Envl. Chemistry, Ontario Research Foundation.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section

RESEARCH CATEGORY					
INTERNAL GRANT	X	UNSOLICITED SOLICITED		MULTI-YEAR CONCURRENT	X

OBJECTIVE

To measure ambient H_2SO_4 aerosol levels in Toronto and Sudbury area during the summer of 1975.

DESCRIPTION

1) Operation of the automated instrument in Toronto
2) Operation of the instrument in the Sudbury area.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$10,400.00	MAN YEARS	

SOURCE OF FUNDS

REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE

No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

Continuous, 2nd year of a 2-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Reactive Hydrocarbon Monitoring Programme (30-75)
KEY WORDS	Reactive Hydrocarbon Monitoring, Photochemical Studies
PRINCIPAL INVESTIGATOR AND AFFILIATION	S.C. Barton, Dept. of Envl. Chemistry, Ontario Research Foundation
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Special Studies & Programme Planning Unit, E. Singer, Head, Monitoring & Instr. Dev. Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY					
INTERNAL GRANT	X	UNSOLICITED SOLICITED		MULTI-YEAR CONCURRENT	X

OBJECTIVE

The Ontario Research Foundation is to provide assistance and consultation to the Air Resources Branch on use of the reactive hydrocarbon monitors in photochemical studies in the Toronto area.

DESCRIPTION

1) Operation and maintenance of instruments at the 67 College St. station.
2) The reactive hydrocarbon data will be evaluated.
3) A paper, as a result, will be prepared jointly for publication.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$10,400.00	MAN YEARS	

SOURCE OF FUNDS						
REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING		JOINTLY FUNDED PROJECT		OTHER

REPORTING PROCEDURE

No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Verification of Design Manual Procedures for Evaluation of Commercial Wet Collector Performance (32-75).
KEY WORDS	Wet Collector, Particulate, Performance of Wet Scrubbers, Collection Efficiency
PRINCIPAL INVESTIGATOR AND AFFILIATION	A.W. Gnyp, Dept. of Chemical Engineering, University of Windsor
LIAISON OFFICER OR SUPERVISOR	E.T. Barrow, Head, New Technology & Process Evaluation, Technology Development & Appraisal Section

RESEARCH CATEGORY: INTERNAL GRANT X | UNSOLICITED SOLICITED | MULTI-YEAR X | CONCURRENT

OBJECTIVE

1) To verify the application of theoretical performance equations to specific models of commercially available wet particulate collectors.
2) To complete the development of guidelines for evaluating the performance of wet scrubbers.

DESCRIPTION

1) Analysis of wet scrubbers.
2) Synthesis of a design equation to each specific wet collector.
3) Development of charts for evaluation of the particulate collection efficiency.
4) To improve design models.

STARTING DATE	June 16, 1975
COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$12,000.00
MAN YEARS	

SOURCE OF FUNDS: REGULAR WORK PROGRAM X | SPECIAL MINISTRY FUNDING ___ | JOINTLY FUNDED PROJECT ___ | OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: Continuous, 4th year of a 4-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE The Relationship Between Ozone and "Blast" on Onions (35-75)

KEY WORDS Injury Symptoms, Onions, Ozone, Control

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Hofstra, Environmental Biology, Guelph University

LIAISON OFFICER OR SUPERVISOR S. Linzon, Supervisor, Phytotoxicology Section.

RESEARCH CATEGORY INTERNAL GRANT X UNSOLICITED SOLICITED MULTI-YEAR X CONCURRENT

OBJECTIVE
1) To describe the development of injury symptoms of onions in southern Ontario.
2) To correlate symptom development with ozone and weather records.
3) To utilize fungicides and antioxidants for the control of symptom development.

DESCRIPTION
1) Plots will be treated with fungicides and antioxidants.
2) Ozone levels will be monitored.
3) Lesions produced on the crop will be examined for disease-causing organisms.

STARTING DATE June 16, 1975 COMPLETION DATE March 31, 1976

BUDGET CURRENT YEAR $9,600.00 MAN YEARS

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS Continuous 2nd year of a 2-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	Fuel Production by the Modified Combustion of Wood Bark and other Wood-Waste Products (39-75)
KEY WORDS	Fuel Production, Combustion, Wood Bark, Wood-Waste Products
PRINCIPAL INVESTIGATOR AND AFFILIATION	R.A. Ross, Dean, Faculty of Science, Lakehead University.
LIAISON OFFICER OR SUPERVISOR	E.T. Barrow, Head, New Technology & Process Evaluation, Technology Development & Appraisal Section

RESEARCH CATEGORY					
INTERNAL GRANT	X	UNSOLICITED SOLICITED		MULTI-YEAR CONCURRENT	X

OBJECTIVE

To study the influence of chemical promoters on combustion of wood bark and other wood-waste products.

DESCRIPTION

1) Will investigate the influence of additives on the gasification of wood waste at T<700°C.
2) Will measure the percentage steam conversion at various steam velocities.
3) Will measure the rate of combustion of the chars. at various steam velocities.
4) Will measure the rate of combustion of the chars. at various temperatures.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$12,000.00	MAN YEARS	

SOURCE OF FUNDS							
REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE

No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

Continuous, 2nd year of a 2-year project.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE: Remote Scanning of Pollutant Gases by Raman Spectrometry (40-75).

KEY WORDS: Remote Scanning, Pollutant Gases, Raman Spectrometry, UV Lasers, Map.

PRINCIPAL INVESTIGATOR AND AFFILIATION: R.L. Hummel & J.W. Smith, Dept. of Chemical Engineering & Applied Chemistry, University of Toronto.

LIAISON OFFICER OR SUPERVISOR: S. Stevens, Head, Special Studies & Programme Planning, Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE

1) UV lasers will be used to sense and map pollutants.
2) The system will be used to provide detailed micrometeorology over the Toronto area.

DESCRIPTION: A gas laser will be used as the UV source. The return signal from pollutant gasses will pass through a Fabry-Perot filter. Light will be separated, detected, measured and recorded.

STARTING DATE: June 16, 1975 COMPLETION DATE: March 31, 1976

BUDGET CURRENT YEAR: $11,000.00 MAN YEARS:

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Initiation of an Experimental Investigation of Gas Atomized Spray Scrubbers (42-75).
KEY WORDS	Gas Atomized Spray Scrubbers, Design Parameters, Venturi.
PRINCIPAL INVESTIGATOR AND AFFILIATION	A.W. Gnyp, Dept. of Chemical Engineering, University of Waterloo.
LIAISON OFFICER OR SUPERVISOR	E.T. Barrow, Head, New Technology & Process Evaluation, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE: To develop design parameters that would optimize the performance of gas atomized spray scrubbers.

DESCRIPTION:

1) Acquisition of pressure drop data for three types of commercially available venturi spray scrubbers.
2) Development of improved pressure drop models.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976
BUDGET CURRENT YEAR	$ 15,950.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Air Resources DATE August 25, 1975

PROJECT TITLE A Study of Urban Haze (43-75)

KEY WORDS Urban Haze, Brown Haze, Aitken Nuclei, NO, NO_2, NO_x, SO_2, Particulate

PRINCIPAL INVESTIGATOR AND AFFILIATION W.J. Megaw, CREO, York University

LIAISON OFFICER OR SUPERVISOR S. Stevens, Special Studies & Programme Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE To study the structure and cause of the brown haze which forms over some large cities in the summer months.

DESCRIPTION Using the aircraft, the following parameters would be measured.

1) Aitken nuclei concentration
2) Droplet concentration and size distribution
3) SO_2 concentrations
4) NO, NO_2, NO_x concentrations
5) Particulate concentrations
6) Temperature, humidity and wind gradients

STARTING DATE June 16, 1975 COMPLETION DATE March 31, 1976

BUDGET CURRENT YEAR $10,000.00 MAN YEARS

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources
DATE	August 25, 1975
PROJECT TITLE	Particulate Pollution in the Nanticoke Region (48-75)
KEY WORDS	Particulate, Nanticoke Region, Monitoring network.
PRINCIPAL INVESTIGATOR AND AFFILIATION	L.D. Pengelly, Dept. of Medicine, McMaster University.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Head, Special Studies & Programme Planning, Technology Development & Appraisal Section.

RESEARCH CATEGORY: INTERNAL GRANT X; UNSOLICITED SOLICITED; MULTI-YEAR X CONCURRENT

OBJECTIVE

1) To study the nature of atmospheric particulates in the Hamilton-Nanticoke Region.
2) To establish scientific basis for planning and development and a permanent particulate monitoring network.

DESCRIPTION

The following parameters would be determined:

1) Particle size distribution
2) Aerosol total loading distributions
3) Elevation effects
4) Wind Direction effects
5) Chemical Composition

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1975
BUDGET CURRENT YEAR	$15,000.00	MAN YEARS	

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT ___; OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: New multi-year project

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Air Resources — DATE August 25, 1975
PROJECT TITLE	Fate of Sulfur Dioxide and Related Materials Scavenged by Rain and Snow
KEY WORDS	Precipitation, deposition, simulation
PRINCIPAL INVESTIGATOR AND AFFILIATION	J.R. Kramer, Dept. of Geology, McMaster University.
LIAISON OFFICER OR SUPERVISOR	S. Stevens, Special Studies & Program Planning Unit, Technology Development & Appraisal Section.

RESEARCH CATEGORY	INTERNAL GRANT X	UNSOLICITED SOLICITED	MULTI-YEAR X CONCURRENT

OBJECTIVE

See next page.

DESCRIPTION

See next page.

STARTING DATE	June 16, 1975	COMPLETION DATE	March 31, 1976.
BUDGET CURRENT YEAR	$39,420.00	MAN YEARS	

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE: No formal report required, except progress report in case of request for additional funding in multi-year programmes.

REMARKS: This is the 4th of a four-year project.

PROJECT TITLE — Fate of Sulfur Dioxide and Related Materials Scavenged by Rain and Snow.

OBJECTIVE — To carry out monthly analysis of precipitation collected in the Sudbury area deposition and precipitation network as well as event experiments so that the fate of emitted pollution can be simulated.

DESCRIPTION

1) To continue to analyse on a monthly basis the 30^{+}_{-} monthly samplers. To add a few new stations to the network.
2) To increase the number of monthly samplers in the Timmins area in order to assess specific loading pertinent to the region.
3) To sample event and wet only precipitation and to sample associated ambient air concentrations.
4) To provide sampling and analytical facilities for four study lakes in the Sudbury programme.
5) To carry out a series of experiments using flow-through electrodes to analyse very short changes in precipitation concentrations in order to obtain scavenging coefficients.
6) To modify the BOX model for atmospheric oxidation of SO_2 to consider pH as a variable and to input differing fall velocities as determined from field size analysis. To run the BOX model for the Sudbury region for 2-3 years of daily meteorological data using the monthly stations as receptors.
7) To modify the EPAEC model by integrating over a series of plume conditions (daily); to modify the oxidation coefficients to apply to the Sudbury situation; to obtain event data with hourly meteorological data in order to evaluate precipitation event predictions to compare with field data.
8) To develop the "best fit" prediction model for loadings in Northern Ontario for a given emission from the Sudbury smelter.

ENVIRONMENTAL

APPROVALS

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Environmental Approvals DATE

PROJECT TITLE Waste Paper Markets in Ontario

KEY WORDS Recycling, Resource Recovery, Economics, Waste Paper Paperstock, Pulp and Paper

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Donnan, Land-Use Coordination & Special Studies Section, Environmental Approvals Branch

LIAISON OFFICER OR SUPERVISOR B.I. Boyko, Technology and Market Development Section, Resource Recovery Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

1. Formulate policies to enhance the demand and supply of the required grades of waste paper.

2. Compile data on market participants.

DESCRIPTION

Once the literature has been reviewed, interviews with industry representatives (paper mills and dealers) will be undertaken to get additional data and to further develop provincial policy with regard to waste paper markets.

STARTING DATE May, 1975 COMPLETION DATE October-November, 1975

BUDGET CURRENT YEAR MAN YEARS Approx. 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

LABORATOPY

SERVICES

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Laboratory Services	DATE	August 15, 1975
PROJECT TITLE	The Determination of "Freons" (Chlorofluorocarbons) in Ambient City Air		
KEY WORDS	Freon, Chlorofluorocarbon, Gas-chromatography, Adsorption, Ozone, Ambient Air		
PRINCIPAL INVESTIGATOR AND AFFILIATION	E.G. Adamek, Air Quality Laboratory, Laboratory Services Branch		
LIAISON OFFICER OR SUPERVISOR	A.C. Rayner, Air Quality Laboratory, Laboratory Services Branch		

RESEARCH CATEGORY	INTERNAL X GRANT	UNSOLICITED SOLICITED	MULTI-YEAR X CONCURRENT

OBJECTIVE

To develop a suitable method for determining "Freons" in air at the parts per trillion level and to apply the method for monitoring this pollutant in ambient air.

DESCRIPTION

Only very recently, the problem of chlorofluorocarbons as air pollutants has arisen by their steadily increasing additions to the atmosphere where photodissociation produces chlorine atoms which are believed to lead to the destruction of atmospheric ozone. This has led to concern about the possibility of increased skin cancer incidence caused by radiation from the sun.

Commencing with the more common "Freons 11, 12 and 13" a suitable gas-chromatographic method with the use of an electron capture detector is being developed for chlorofluorocarbons in general and at the low concentrations of parts per trillion, as required for ambient air samples. Because of these low concentrations, special attention will be directed also to the proper design of sampling procedures in order to avoid accumulation of Freon at the inside walls of the sample containers.

STARTING DATE	July, 1975	COMPLETION DATE	July, 1976
BUDGET CURRENT YEAR	$7,900	MAN YEARS	0.30

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___		
REPORTING PROCEDURE	Bi-monthly progress reports					

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Laboratory Services — DATE August 14, 1975
PROJECT TITLE	Determination of Ultra Trace Quantities of Tin in Water, Air, Soil and Vegetation by AA Spectrophotometry
KEY WORDS	Absorbance, Sensitivity, Detection Limits, Tin, Spectrophotometry, Gas Phase Sampling
PRINCIPAL INVESTIGATOR AND AFFILIATION	P.N. Vijan, Air Quality Laboratory, Laboratory Services Branch
LIAISON OFFICER OR SUPERVISOR	A.C. Rayner, Air Quality Laboratory, Laboratory Services Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop a rapid sensitive and precise method for the determination of tin in the environment.

DESCRIPTION

There is no proven capability for tin analysis in this section. Requests for tin analysis are being made. There is a possibility that the metal will assume importance because of its widespread use in the food industry.

The instrumental parameters will be optimized for best signal to noise ratio by using pure tin standards. Having established the parameters, matrix interference problems will be studied and recovery experiments will be conducted. Possibly, organometallic-complexation or coprecipitation techniques will be tried to overcome interference.

STARTING DATE	April, 1975	COMPLETION DATE	January, 1976
BUDGET CURRENT YEAR	$10,700	MAN YEARS	0.33

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE: Bi-monthly progress reports and final summary report

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Laboratory Services DATE August 14, 1975

PROJECT TITLE Evaluation of Methods for the Analysis of Asbestiform Minerals in Environmental Samples

KEY WORDS Asbestos, Air, Water

PRINCIPAL INVESTIGATOR AND AFFILIATION J.A. Pimenta, Air Quality Laboratory, Laboratory Services Branch

LIAISON OFFICER OR SUPERVISOR A.C. Rayner, Air Quality Laboratory, Laboratory Services Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To evaluate analytical techniques for determination of asbestiform minerals in air, water, sediment samples etc.

DESCRIPTION

The Laboratory Services Branch will shortly be engaged in a large-scale asbestos analysis programme. The types of samples are expected to be air, water, sediment and stack emissions. At the present time, each laboratory with expertise in asbestos analysis tends to follow its own analytical technique, in lieu of a standard method.

An extensive literature survey has been made of various analytical techniques presently in use. The most promising methods will be experimentally tested and a method or modification that best conforms to Laboratory Branch analytical standards will be selected.

STARTING DATE September, 1975 (est.) COMPLETION DATE December, 1975 (est.)

BUDGET CURRENT YEAR $10,300 MAN YEARS 0.42

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Bi-monthly progress reports

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Laboratory Services DATE August 25, 1975

PROJECT TITLE Determination of Volatile Organohalides in Drinking Waters

KEY WORDS Trace Analysis, Gas Chromatography, Organohalides, Chloroform, Drinking Water

PRINCIPAL INVESTIGATOR AND AFFILIATION A.A. Nicholson, Organic Trace Contaminants Section, Laboratory Services Branch

LIAISON OFFICER OR SUPERVISOR O. Meresz, Organic Trace Contaminants Section, Laboratory Services Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR X
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop accurate and convenient methods for the analysis of water samples for the presence of volatile organohalides in the low ppb range.

DESCRIPTION

The presence of volatile organohalides in finished drinking waters was reported in the U.S.A. and other countries. The effects of chronic exposure to very low levels of these compounds cannot be assessed at the present time.

A reliable analytical method was required to mount an extensive screening programme in which drinking waters in Ontario are examined and monitored for the presence of haloforms and other volatile organohalides.

Adopt or develop suitable trace analytical method.

Identify and quantitate volatile organohalides.

Make comparisons of data obtained and those of other laboratories.

If possible, automate analytical procedure.

Originate concurrent research projects to identify the sources of haloforms and the mechanism of their formation from raw waters.

STARTING DATE October, 1974 COMPLETION DATE September, 1976

BUDGET CURRENT YEAR $19,000.00 MAN YEARS 1.04

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Quarterly status reports

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Laboratory Services
DATE	August 25, 1975
PROJECT TITLE	Development of Analytical Methods for Trace Metals not Currently Analyzed in Water
KEY WORDS	Analytical Methods, Trace Metals
PRINCIPAL INVESTIGATOR AND AFFILIATION	B.R. Loescher, Inorganic Trace Contaminants Section, Laboratory Services Branch
LIAISON OFFICER OR SUPERVISOR	J.N. Bishop, Inorganic Trace Contaminants Section, Laboratory Services Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR X
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To provide methodology for reliable determination of vanadium, bismuth, tungsten, antimony and selenium in waters at ppb levels using fluorimetry, AAS and/or colourimetry.

DESCRIPTION

Increased demand for ultra trace analyses to determine ambient levels of metals in unpolluted areas requires the laboratory to constantly seek to improve our detection limits and develop methods for new parameters.

Existing literature methods will be surveyed, implemented or adapted to meet our requirements.

STARTING DATE	September, 1974	COMPLETION DATE	September, 1976
BUDGET CURRENT YEAR	$11,500	MAN YEARS	0.80

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE	Bi-monthly progress reports, summary report

REMARKS

POLLUTION

CONTROL

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 20, 1975

PROJECT TITLE: Interactions of Pesticides and their Metabolites with Microbial Transformation in Soil and Fresh Water Ecosystems

KEY WORDS: Metabolites, Microbial Transformations, Ecosystems

PRINCIPAL INVESTIGATOR AND AFFILIATION: C. Corke, University of Guelph

LIAISON OFFICER OR SUPERVISOR: Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To identify interactions of pesticides and their metabolites with microbial transformations in soil and fresh water ecosystems.

DESCRIPTION

Assessment (in a laboratory study) of the effects of representative herbicides of the classes, s-triazine, substituted areas, phenylcarbanates acylanilides, some of their degradation products, and the insecticide diazinon, abate, dursban, on nitrogen-fixing blue-green algae.

STARTING DATE: 1974 COMPLETION DATE: 1976

BUDGET CURRENT YEAR: $4,040 MAN YEARS: 2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 20, 1975

PROJECT TITLE Reduction of Fungicide Usage on Vegetable Crops by Scheduling Sprays According to Weather Data

KEY WORDS Fungicide, Weather Data

PRINCIPAL INVESTIGATOR AND AFFILIATION T.J. Gillespie and J.C. Sutton, University of Guelph

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To schedule only necessary sprays as opposed to a regular preventative programme.

DESCRIPTION

(a) To test on a commercial scale our recently developed scheme for reducing the number of fungicide applications required for satisfactory control of carrot blight disease.

(b) To derive an onion blight spray scheme based on weather data that will provide adequate disease control while reducing fungicide usage.

STARTING DATE 1975 COMPLETION DATE 1976

BUDGET CURRENT YEAR $6,034 MAN YEARS 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 20, 1975

PROJECT TITLE Effects of Sublethal Concentrations of Diazinon on Stream Invertebrates

KEY WORDS Diazinon, Stream Invertebrates

PRINCIPAL INVESTIGATOR AND AFFILIATION N.K. Kaushik, University of Guelph

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To identify the effects of sublethal concentrations of diazinon on stream invertebrates.

DESCRIPTION

(a) To investigate effects of transient and prolonged exposure to sublethal doses of diazinon on invertebrate activities (drift and movement, feeding, respiration, growth, reproduction, etc.).

(b) To investigate changes, if any, in the patterns of diversity of stream bethos exposed to prolonged and repetitive introduction of low levels of diazinon.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$5,554	MAN YEARS	2

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control — DATE August 20, 1975
PROJECT TITLE	Control of the Onion Maggot, Hylemya antiqua (Meigen), by Use of the Sterile Male Technique
KEY WORDS	Onion Maggot, Sterile Male Technique
PRINCIPAL INVESTIGATOR AND AFFILIATION	F.L. McEwen, University of Guelph
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To evaluate the biological and physical parameters that determine the successful use of the sterile male technique to control the onion maggot.

DESCRIPTION

The onion maggot is a major pest of onions throughout the world. In most onion-growing areas of Canada, there are three generations per year and control procedures consist of an application of insecticide in the seed furrow at planting, plus foliage applications throughout the season. Organophosphate insecticides are used. Failure to control the onion maggot results in almost complete crop loss.

Considerable progress has been made using the sterile male technique, the programme being in its third year.

STARTING DATE	1973	COMPLETION DATE	1976 or 1977
BUDGET CURRENT YEAR	$23,139	MAN YEARS	3 or 4

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control
DATE	August 20, 1975
PROJECT TITLE	Biology and Control of the Crucifier Flea Beetle in Southwestern Ontario
KEY WORDS	Crucifier Flea Beetle
PRINCIPAL INVESTIGATOR AND AFFILIATION	Ontario Fruit and Vegetable Growers Association University of Guelph
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To study the biology and control of the crucifier flea beetle in Southwestern Ontario.

DESCRIPTION

(a) To complete an intensive study in the laboratory and field on the biology of Phyllotreta cruciferae.

(b) To initiate a survey to determine the extent and gravity of crucifier flea beetle infestations in Southwestern Ontario.

(c) To determine the effectiveness of allyl isothiocyanate as a monitoring device and method of reducing flea beetle populations.

(d) To investigate the efficacy of planting water treatments for flea beetle control.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$4,800	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 22, 1975

PROJECT TITLE Compare and Contrast the Effect of Dursban and Diazinon upon the Growth of Fresh Water Algae

KEY WORDS Dursban, Diazinon, Algae

PRINCIPAL INVESTIGATOR AND AFFILIATION J.R. Brown, University of Toronto

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To compare and contrast the effect of dursban and diazinon upon the growth of fresh water algae.

DESCRIPTION

To study the effect of dursban and diazinon on the growth of fresh water phytoplankton under natural conditions.

STARTING DATE 1975 COMPLETION DATE 1976

BUDGET CURRENT YEAR $7,000 MAN YEARS 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE

PROJECT TITLE Effect of the Dipyridyl Herbicides Paraquat and Diquat on Non-target Organisms

KEY WORDS Dipyridyl Herbicides

PRINCIPAL INVESTIGATOR AND AFFILIATION C.I. Mayfield

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To determine what possible effects paraquat and diquat may have on fundamental activities of microbiological life forms in soil.

DESCRIPTION

Monitoring migration of applied herbicides in soil. Assessment of effects of applications on members, biochemical activities, of representative samples of microbial populations in soils and sediment.

STARTING DATE 1975 COMPLETION DATE 1976

BUDGET CURRENT YEAR $1,050 MAN YEARS 1-1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 21, 1975

PROJECT TITLE: Electrostatic Application of Pesticides in Orchards and Field Crops

KEY WORDS: Electrostatic Application of Pesticides

PRINCIPAL INVESTIGATOR AND AFFILIATION: I.I. Inculet, University of Western Ontario

LIAISON OFFICER OR SUPERVISOR: Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED X	CONCURRENT

OBJECTIVE

To explore the feasibility of using minimum-waste electrostatic pesticide application technique for orchard and field crop foliage, and to develop a working applicator model, suitable for mounting on a tractor.

DESCRIPTION

This is the third year of a three year study to improve depositions and reduce spray drift.

STARTING DATE: 1974 COMPLETION DATE: 1976

BUDGET CURRENT YEAR: $5,100 MAN YEARS: 2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control
DATE	August 19, 1975
PROJECT TITLE	Residues Accumulating in Organic Soils and their Movement into Adjacent Drainage Systems
KEY WORDS	Residues, Organic Soils, Leaching from Organic Soils
PRINCIPAL INVESTIGATOR AND AFFILIATION	E.Y. Spencer and J.R. Miles, University of Western Ontario
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To study residues accumulating in organic soils used in vegetable production in Ontario and movement of residues into adjacent drainage systems.

DESCRIPTION

(a) To monitor residues of organochlorine, organophosphorus and carbamate insecticides accumulating in farm soils at the Holland Marsh as a result of past and current insecticide use patterns.

(b) To monitor residues of organochlorine, organophosphorus and carbamate insecticides appearing in sediments, water and fish in the drainage canals, the Schomberg River and Cook's Bay, Lake Simcoe.

(c) To determine under laboratory conditions the persistence of selected organochlorine, organophosphorus and carbamate insecticides in water and factors influencing persistence.

(d) To determine under laboratory conditions the behaviour of selected organochlorine, organophosphorus and carbamate insecticides in water in the presence of organic and mineral sediments.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$6,500	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control
DATE	August 19, 1975
PROJECT TITLE	The Responses of Bacteria, Algae, Invertebrates in Small Ponds to Applications of Mosquito Larvicides
KEY WORDS	Bacteria, Algae, Invertebrates, Small Ponds, Mosquito Larvicides
PRINCIPAL INVESTIGATOR AND AFFILIATION	M.G. Boyer and C.D. Fowle, York University
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To investigate the response of bacteria, algae, invertebrates in small ponds to application of mosquito larvicides.

DESCRIPTION

Assess the effects of chloropyrifos and abate on the important chemical characteristics of water in artificial ponds, bacteria number and the effect of the pesticides on the overall productivity of the ponds through comparisons of carbon dioxide and oxygen production under certain conditions, and through the role of which organic matter is decomposed.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$12,260	MAN YEARS	2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE Biological Control of St. John's-Wort

KEY WORDS St. John's-Wort

PRINCIPAL INVESTIGATOR AND AFFILIATION J.F. Alex, University of Guelph

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To examine the effectiveness of Chrysolina beetles as a control agent under Ontario conditions.

DESCRIPTION

Examine the distribution and ecological life-history of St. John's-Wort in Ontario, monitor the effectiveness of the beetles as a control agent under our conditions and examine the response of associated pasture vegetation to the biological elimination of St. John's-Wort.

STARTING DATE 1974 COMPLETION DATE 1976

BUDGET CURRENT YEAR $4,000 MAN YEARS 2

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE Disease Control in Turfgrass

KEY WORDS Turfgrass

PRINCIPAL INVESTIGATOR AND AFFILIATION S.G. Fushley, University of Guelph

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

Disease control in turfgrass - an integrated approach to control of Helminthosporium and Sclerotinia.

DESCRIPTION

(a) To investigate means of predicting disease in order to facilitate control measures in advance.

(b) To investigate the usefulness of management practices other than the use of pesticides for disease control.

(c) To develop schedules for using pesticides only when necessary.

(d) To develop a programme of turfgrass management that will ensure freedom from disease with a minimum use of pesticidal chemicals.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$3,360	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control
DATE	August 20, 1975
PROJECT TITLE	To Investigate the Side Effects Associated with the Use of Insect Growth Regulators, Abate for Mosquito Control
KEY WORDS	Mosquito, Abate, Growth Regulator
PRINCIPAL INVESTIGATOR AND AFFILIATION	R.G.H. Downer and S.M. Smith, University of Waterloo
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED X	CONCURRENT

OBJECTIVE

To investigate the side effects associated with the use of insect growth regulators, abate for mosquito control.

DESCRIPTION

(a) To Monitor fluctuations in population of selected invertebrate species present in three mosquito breeding sites at Camp Borden, following application of IGR at commercially recommended dosages.

(b) To compare data collected with those compiled in previous years and thus reveal any environmental perturbations associated with the use of IGR for mosquito control in Ontario.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$2,800	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE: Economic Threshold of Cereal Leaf Beetles on Oats and Barley in Ontario

KEY WORDS: Cereal Leaf Beetles, Oats, Barley

PRINCIPAL INVESTIGATOR AND AFFILIATION: C.R. Ellis, University of Guelph

LIAISON OFFICER OR SUPERVISOR: Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To establish the economic threshold of cereal leaf beetles on oats and barley in Ontario.

DESCRIPTION

(a) To obtain various populations of cereal leaf beetle on oats and barley by application of pesticide to infested fields and to obtain grain yield for these field plots.

(b) To obtain yield data from caged oats and barley infested with various populations by cereal leaf beetle.

(c) To determine how the stage of the crop, when attacked, affects the economic threshold.

(d) To determine the time of parasite activity (Tetrastichus incertus) with respect to spray time.

STARTING DATE: 1975 COMPLETION DATE: 1976

BUDGET CURRENT YEAR: $4,500 MAN YEARS: 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE: The Feasibility of Implementing the Pest Monitoring System for Apple Growing Areas of Ontario

KEY WORDS: Pest Monitoring, Apple

PRINCIPAL INVESTIGATOR AND AFFILIATION: Ontario Fruit and Vegetable Growers Association

LIAISON OFFICER OR SUPERVISOR: Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED X	CONCURRENT

OBJECTIVE

To investigate the feasibility of implementing a pest monitoring system for apple growing areas of Ontario.

DESCRIPTION

Develop pest monitoring procedures for economically important insects and diseases and set up a pilot pest management programme involving monitoring stations in the Georgian Bay area aimed at reducing the pesticide load.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$6,200	MAN YEARS	2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE: Simultaneous deterioration of intact benomyl and its degradation product, methyl benzimidazol carbamate (MBC) in plants in relation to their biological activities.

KEY WORDS: Benomyl, Methyl Benzimidazol Carbamate

PRINCIPAL INVESTIGATOR AND AFFILIATION: M. Chiba, Brock University

LIAISON OFFICER OR SUPERVISOR: Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To study the simultaneous deterioration of intact benomyl and its degradation product, methyl benzimidazol carbamate (MBC) in plants in relation to their biological activities.

DESCRIPTION

STARTING DATE: 1975 COMPLETION DATE: 1976

BUDGET CURRENT YEAR: $6,200 MAN YEARS: 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 20, 1975

PROJECT TITLE The Effect of Mosquito Larvicides on Algal Productivity and the Uptake of Inorganic Substrates by Phytoplankton

KEY WORDS Mosquito Larvicides, Algae, Phytoplankton

PRINCIPAL INVESTIGATOR AND AFFILIATION B. Colman, Dept. of Biology, York University

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To study the effect of mosquito larvicides on algal productivity and the uptake of inorganic substrates by phytoplankton.

DESCRIPTION

Study will include abate and dursban larvicides.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$13,560	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control	DATE	August 19, 1975
PROJECT TITLE	Effects of Pesticides on the Meiotic Spindle and on Chromosome Movements		
KEY WORDS	Chromosome		
PRINCIPAL INVESTIGATOR AND AFFILIATION	A. Forer, Dept. of Biology, York University		
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee		

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To elucidate the effects of pesticides on chromosome movements and meiotic spindle.

DESCRIPTION

The study will involve parathion and carbofuron.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$1,200	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 19, 1975

PROJECT TITLE Reduction of Drift with 2,4-D

KEY WORDS 2,4-D, Drift

PRINCIPAL INVESTIGATOR AND AFFILIATION G.R. Stephenson, University of Guelph

LIAISON OFFICER OR SUPERVISOR Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

The reduction of herbicidal drift in roadside spraying with 2,4-D.

DESCRIPTION

This is a continuation of the 1974 study involving various inverts and drift control agents.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$2,000	MAN YEARS	2

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control — DATE August 20, 1975
PROJECT TITLE	Persistence of Residues of Organophosphorus Insecticides in Organic Soils used for Vegetable Production in Southwestern Ontario.
KEY WORDS	Residues, Organic Soils, Organophosphorus Insecticides, Drainage Systems
PRINCIPAL INVESTIGATOR AND AFFILIATION	E.Y. Spencer and R.A. Chapman, University of Western Ontario
LIAISON OFFICER OR SUPERVISOR	Pesticides Advisory Committee

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To study persistence of residues of organic phosphorus insecticides in organic soils used for vegetable production in Southwestern Ontario.

DESCRIPTION

(a) To monitor residues of organophosphorus insecticides accumulating in organic soils at the Holland Marsh as a result of past and current insecticide use patterns.

(b) To determine under field conditions the relative persistence of selected organophosphorus insecticides in mineral and organic soils.

(c) To determine the factors influencing persistence of selected organophosphorus insecticides in organic soils.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$6,500	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control
DATE	August 25, 1975
PROJECT TITLE	Sewage Treatment Plant Effluent Disinfection
KEY WORDS	Disinfection, Bromine Chloride, Chlorine
PRINCIPAL INVESTIGATOR AND AFFILIATION	A. Oda, Water Technology Section, Pollution Control Branch
LIAISON OFFICER OR SUPERVISOR	M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To investigate alternatives to chlorination.

DESCRIPTION

Pilot plant studies using bromine chloride

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$12,000	MAN YEARS	1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE: Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE

PROJECT TITLE Sand Filtration of Septic Tank Effluent

KEY WORDS Filtration, Effluent Treatment, Septic Tank, Purification

PRINCIPAL INVESTIGATOR AND AFFILIATION N.A. Chowdhry, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY INTERNAL X GRANT UNSOLICITED SOLICITED MULTI-YEAR CONCURRENT

OBJECTIVE

To provide an alternative disposal system to a conventional tile bed.

DESCRIPTION

The operation and monitoring of sand filters on a septic tank effluent.

STARTING DATE 1975 COMPLETION DATE

BUDGET CURRENT YEAR $28,000 MAN YEARS 1

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Tile Field Tracer Study

KEY WORDS Labelled Tracers, Septic Tanks, Effluent

PRINCIPAL INVESTIGATOR AND AFFILIATION M. Brandes, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the fate of pollutants from cottage septic tanks.

DESCRIPTION

The injection and recovery of labelled tracers in the tile field discharge.

STARTING DATE

COMPLETION DATE 1975

BUDGET CURRENT YEAR $18,000

MAN YEARS 1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Report in preparation

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Underground Movement of Contaminants

KEY WORDS Sewage Effluent, Underground Flow, Contaminant Recovery

PRINCIPAL INVESTIGATOR AND AFFILIATION N. Ehlert, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the subsurface movement of land-disposed municipal sewage treatment plant effluent.

DESCRIPTION

The subsurface injection and recovery of contaminants in municipal sewage treatment plant effluent.

STARTING DATE 1974 COMPLETION DATE

BUDGET CURRENT YEAR $18,000 MAN YEARS 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Water Main Insulation

KEY WORDS Styrofoam, Buried water mains, Insulation

PRINCIPAL INVESTIGATOR AND AFFILIATION M.B. Fielding, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the effectiveness of Syrofoam as insulation for buried water mains.

DESCRIPTION

Monitoring soil temperature over a 2,000 foot test section of buried water main with the insulation installed over the pipe.

STARTING DATE

COMPLETION DATE

BUDGET CURRENT YEAR $9,000

MAN YEARS 1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Centrifugation of Raw Sewage

KEY WORDS Centrifuge, Sewage, Solids Removal

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Zarnett, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine feasibility of raw sewage centrifugation.

DESCRIPTION

Pilot study.

STARTING DATE

COMPLETION DATE 1975

BUDGET CURRENT YEAR $8,000

MAN YEARS 1/4

SOURCE OF FUNDS

REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
X	___	___	___

REPORTING PROCEDURE Report published 1975

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE I.J.C. - PLUARG Study of Septic Tank Discharges

KEY WORDS Discharge, Water Quality, Great Lakes

PRINCIPAL INVESTIGATOR AND AFFILIATION H.T. Chan, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the effect of septic tank discharges on the Great Lakes.

DESCRIPTION

Monitoring existing installations to determine contaminants reaching the Great Lakes.

STARTING DATE 1974 COMPLETION DATE 1977

BUDGET CURRENT YEAR $39,000 I.J.C. $15,000 MOE MAN YEARS 3

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT I.J.C. OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Chemical Precipitation of Phosphorus in Septic Tanks

KEY WORDS Ferric Chloride, Phosphorus, Septic Tank, Chemical Dosage

PRINCIPAL INVESTIGATOR AND AFFILIATION M. Brandes, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop and test chemical dosing device.

DESCRIPTION

Pilot study to test effectiveness of dosing mechanism in the chemical removal of phosphorus in a septic tank.

STARTING DATE

COMPLETION DATE

BUDGET CURRENT YEAR $20,000

MAN YEARS 1/2

SOURCE OF FUNDS

REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
X	___	___	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Raised Tile Field

KEY WORDS Raised Bed, Tile Field, Effluent Treatment, Disposal

PRINCIPAL INVESTIGATOR AND AFFILIATION M. Brandes, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X GRANT	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT

OBJECTIVE

To determine the effectiveness of a raised tile bed in treating septic tank effluent.

DESCRIPTION

A pilot plant field study with full monitoring.

STARTING DATE 1975 COMPLETION DATE

BUDGET CURRENT YEAR $25,000 MAN YEARS 1/3

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Correlation of Percolation Test with Transmissibility

KEY WORDS Percolation, Transmissibility

PRINCIPAL INVESTIGATOR AND AFFILIATION H.T. Chan, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To rate standard percolation test to the actual transmissibility of the soil.

DESCRIPTION

Field trials to obtain test data of the actual correlation.

STARTING DATE

COMPLETION DATE 1975

BUDGET CURRENT YEAR $8,000

MAN YEARS 1/4

SOURCE OF FUNDS

REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE Report in publication

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Ion Exchange Capability of Soils

KEY WORDS Ion Exchange, Soils

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Zarnett, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To characterize ion exchange capability of various soils.

DESCRIPTION

Laboratory analysis of soil samples.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$16,000	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING		JOINTLY FUNDED PROJECT		OTHER	

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Land Disposal of Sewage

KEY WORDS Spray Irrigation, Surface Run-off

PRINCIPAL INVESTIGATOR AND AFFILIATION N. Ehlert, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine efficiency and operating parameters of land disposal systems.

DESCRIPTION

Pilot plant operation of spray irrigation and surface runoff systems.

STARTING DATE		COMPLETION DATE	1975
BUDGET CURRENT YEAR	$10,000	MAN YEARS	1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE One report published, one in press (Canada-Ontario Agreement) and one in preparation.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Rainfall - Building Tile Flow Correlation

KEY WORDS Rainfall, Building Tile, Drainage Flow

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Zarnett, Applied Sciences Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine quantity and quality of weeping tile flow.

DESCRIPTION

Measurement of existing installations and development of theory.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$12,000	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING		JOINTLY FUNDED PROJECT		OTHER	

REPORTING PROCEDURE Three reports published

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE August 25, 1975

PROJECT TITLE Municipal Water Treatment by Reverse Osmosis

KEY WORDS Water Treatment, Drinking Water, Reverse Osmosis, Purification

PRINCIPAL INVESTIGATOR AND AFFILIATION T. Tonelli, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR M.B. Fielding, Applied Sciences Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

Process feasibility study of reverse osmosis for the production of potable water.

DESCRIPTION

A pilot plant operation to determine the operating efficiency and costs.

STARTING DATE

COMPLETION DATE

BUDGET CURRENT YEAR $10,000

MAN YEARS 1

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT ___; OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 4, 1975

PROJECT TITLE Water Distribution System, Small Animal Survey

KEY WORDS Potable Water, Drinking Water, Distribution, Treated Water, Water Quality, Animal Species

PRINCIPAL INVESTIGATOR AND AFFILIATION H.J. Graham, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To study small animals, e.g. snails, nematodes, in water distribution systems.

DESCRIPTION

Sample collection and survey following foam swab cleaning of distribution mains; isolation, identification and enumeration of animal species.

STARTING DATE 1975 COMPLETION DATE -

BUDGET CURRENT YEAR $10,500 MAN YEARS 1/2

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Asbestos Removal from Potable Water

KEY WORDS Asbestos, Coagulation, Flocculation, Settling, Filtration, Alum

PRINCIPAL INVESTIGATOR AND AFFILIATION R.B. Hunsinger, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To investigate the optimization of asbestos removal during water treatment.

DESCRIPTION

Potable water treatment optimized for turbidity removal and further optimized (if necessary) by polymer addition.

STARTING DATE 1975 COMPLETION DATE 1976

BUDGET CURRENT YEAR $42,000 MAN YEARS 1-1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Raw Water Colour Removal

KEY WORDS Flocculation, Biodegradation, Adsorption, Absorption

PRINCIPAL INVESTIGATOR AND AFFILIATION F.J. Dart, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To investigate the physico-chemical and biological mechanisms involved in the reduction of colour.

DESCRIPTION

Studies in the laboratory into the various catalysts and mechanisms in the colour removal process.

STARTING DATE	1974	COMPLETION DATE	-
BUDGET CURRENT YEAR	$7,500	MAN YEARS	1/3

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Ozonation of Drinking Water

KEY WORDS Disinfection, Oxidation, Taste and Odour, Colour Removal

PRINCIPAL INVESTIGATOR AND AFFILIATION F.J. Dart) Water Technology Section,
A. Oda) Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

Study colour removal, disinfection, taste and odour control in drinking water.

DESCRIPTION

Laboratory and pilot plant studies into colour removal mechanisms. Organic chemical changes resulting from ozonation.

STARTING DATE 1974 COMPLETION DATE -

BUDGET CURRENT YEAR $10,500 MAN YEARS 1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Water Distribution Syster Survey

KEY WORDS Biodegradation, Chemodegradation

PRINCIPAL INVESTIGATOR AND AFFILIATION A.H. Vajdic, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

Examine bacteriological quality in distribution systems and obtain correlation with raw and treated water quality parameters.

DESCRIPTION

Sampling survey of raw and treated water and water distribution systems from a number of treatment plants.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$22,500	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Water Treatment by Air Floatation

KEY WORDS Coagulation, Floatation, Air, Separation

PRINCIPAL INVESTIGATOR AND AFFILIATION A. Oda, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To investigate the use of dissolved-air floatation as a potable water treatment process.

DESCRIPTION

Pilot-plant operation to study treatment; expecially investigate algae removal.

STARTING DATE 1975 COMPLETION DATE 1977

BUDGET CURRENT YEAR $21,500 MAN YEARS 1/2

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Chlorinated Organics

KEY WORDS Removal, Detection

PRINCIPAL INVESTIGATOR AND AFFILIATION
A. Nicholson, Laboratory Services Branch
D. Wemyss) Water Technology Section,
C. Fung) Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR
K.J. Roberts, Water Technology Section, Pollution Control Branch
O. Meresz, Laboratory Services Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To survey chloro-organics present in raw and treated waters; examine methods of removal.

DESCRIPTION

Sample survey; analytical detection methods development; treatment removal methods development.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$17,500 Pollution Control	MAN YEARS	1

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Internal as developed
External on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Water Treatment Plant Wastes

KEY WORDS Magnitude, Type, Treatment, Disposal

PRINCIPAL INVESTIGATOR AND AFFILIATION A. Galati) Water Technology Section,
Z. Khan) Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR K.J. Roberts, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To study the magnitude and type of water treatment plant wastes discharged in Ontario.

DESCRIPTION

Carried out by means of questionnaire and sampling survey.

STARTING DATE	1975	COMPLETION DATE	1975
BUDGET CURRENT YEAR	$35,000	MAN YEARS	2-1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT COA	OTHER ___

REPORTING PROCEDURE Report December, 1975

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Parasites in Sewage Sludges

KEY WORDS Identification, Enumeration, Parasites, Ova, Cysts

PRINCIPAL INVESTIGATOR AND AFFILIATION W. Chiang, Water Technology Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR H.J. Graham, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To assess the health hazard associated with parasites in sewage sludges used on land.

DESCRIPTION

Isolation, identification and enumeration of parasites, ova and cysts.

STARTING DATE	1975	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$17,000	MAN YEARS	1-1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT COA	OTHER ___

REPORTING PROCEDURE Report on completion, 1976

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE July 10, 1975

PROJECT TITLE Enteroviruses in Sewage Sludges

KEY WORDS Enteroviruses, Isolation

PRINCIPAL INVESTIGATOR AND AFFILIATION T.B. Subrahmanyan, Ministry of Health

LIAISON OFFICER OR SUPERVISOR A.H. Vajdic, Water Technology Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To assess the health hazard of enteroviruses in sludge in its utilization of land.

DESCRIPTION

Isolation, enumeration and identification of enteroviruses.

STARTING DATE	1973	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$36,000	MAN YEARS	1-1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT COA	OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Physical/Chemical Treatment of Municipal Wastewater

KEY WORDS Physical, Chemical, Biological, Wastewater, Treatment, Adsorption

PRINCIPAL INVESTIGATOR AND AFFILIATION T. Higgs, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To investigate on a field scale, the application of physical/chemical processes in conjunction with, and separate from, biological treatment for the partial to complete treatment of municipal wastewater.

DESCRIPTION

The study is being carried out at the Bolton WPCP. Treatment processes include the use of powdered carbon with WPCP facilities for both physical/chemical treatment of raw sewage and post secondary treatment in combination with chemicals for P removal. Granular performance is being investigated with a two column system on raw sewage, and a four column system for tertiary treatment. Selective ion exchange is being investigated for ammonia removal.

STARTING DATE April, 1972 COMPLETION DATE December, 1975.

BUDGET CURRENT YEAR $80,000 MAN YEARS 4

SOURCE OF FUNDS: REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT COA OTHER ___

REPORTING PROCEDURE Report by March, 1976.

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Effluent Disinfection

KEY WORDS Ozone, Chlorine, Chlorine Dioxide, Fish, Toxicity

PRINCIPAL INVESTIGATOR AND AFFILIATION A. Ho, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To study the efficiency, advantages and disadvantages of various disinfection techniques and evaluate the toxicity of effluents produced.

DESCRIPTION

Studies are proceeding with chlorine, ozone and chlorine dioxide to compare efficiencies of bacteria and viral disinfection using activated sludge process effluent. Fish toxicity trials are being conducted.

STARTING DATE April, 1975 COMPLETION DATE December, 1975

BUDGET CURRENT YEAR $40,000 MAN YEARS 3

SOURCE OF FUNDS: REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT COA OTHER ___

REPORTING PROCEDURE Report in March, 1976

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Pollution Control Branch
DATE	June, 1975
PROJECT TITLE	Evaluation of Small-Scale Carbon Regeneration
KEY WORDS	Activated Carbon, Regeneration, Adsorption
PRINCIPAL INVESTIGATOR AND AFFILIATION	T. Higgs, Wastewater Treatment Section, Pollution Control Branch
LIAISON OFFICER OR SUPERVISOR	S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY			
	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To evaluate the application of small-scale carbon regeneration systems.

DESCRIPTION

Study involves full-scale carbon regeneration in a rotary kiln with a capacity of 100 lbs activated carbon per hour.

STARTING DATE	March, 1975	COMPLETION DATE	September, 1976
BUDGET CURRENT YEAR	$150,000	MAN YEARS	1

SOURCE OF FUNDS							
	REGULAR WORK PROGRAM ___		SPECIAL MINISTRY FUNDING ___		JOINTLY FUNDED PROJECT ___ COA	OTHER ___	

REPORTING PROCEDURE	Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Thermophilic Anaerobic Digestion

KEY WORDS Anaerobic, Digestion, Thermophilic

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Smart, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To study the applicability of thermophilic digestion as a sewage sludge treatment process.

DESCRIPTION

Study is being carried out at the Elmira WPCP at loadings ranging from 0.08 to 0.4 lbs volatile solids per cu ft per day.

STARTING DATE April, 1973 COMPLETION DATE September, 1975

BUDGET CURRENT YEAR $30,000 MAN YEARS 1-1/2

SOURCE OF FUNDS: REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT COA OTHER ___

REPORTING PROCEDURE Report by December, 1975

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Stormwater Treatment

KEY WORDS Solids Removal

PRINCIPAL INVESTIGATOR AND AFFILIATION H. Kronis, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To establish the efficiency of high rate mesh screens for the treatment of storm flow.

DESCRIPTION

Evaluation of Sweco screen, Bauer Hydrosieve, Dorr-Oliver Long screen, and Roto-strainer are being conducted.

STARTING DATE	November, 1972	COMPLETION DATE	June, 1975
BUDGET CURRENT YEAR	$25,000	MAN YEARS	1-1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT COA	OTHER ___

REPORTING PROCEDURE Interim report prepared

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Biological Nitrification-Denitrification Process Evaluation

KEY WORDS Two Sludge, Single Sludge

PRINCIPAL INVESTIGATOR AND AFFILIATION A.G. Smith, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the operating parameters and capabilities of the biological nitrification and denitrification process.

DESCRIPTION

Laboratory-pilot-full scale field evaluation.

STARTING DATE	December, 1971	COMPLETION DATE	December, 1975
BUDGET CURRENT YEAR	$30,000	MAN YEARS	2-1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT COA	OTHER ___

REPORTING PROCEDURE Interim reports prepared

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control Branch DATE June, 1975

PROJECT TITLE Upgrading of Lagoon Effluents

KEY WORDS Coagulation, Sedimentation, Filtration, Biodisc, Microstraining

PRINCIPAL INVESTIGATOR AND AFFILIATION K. Chisholm, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the effluent quality attainable by applying standard unit processes to the treatment of lagoon effluents.

DESCRIPTION

Unit processes being investigated at the Strathroy lagoon include dual media filtration, dissolved air floatation, microstraining and biological contactor.

STARTING DATE September, 1974 COMPLETION DATE December, 1975

BUDGET CURRENT YEAR $50,000 MAN YEARS 1

SOURCE OF FUNDS REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT COA OTHER ___

REPORTING PROCEDURE Report in January, 1976

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Assessment of Municipal Bypass Flows

KEY WORDS Sewerage, Bypass, Untreated

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Zukovs, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To collect data on quality and quantity of municipal sewerage bypass flows.

DESCRIPTION

Installations have been made at four municipalities, one with partly combined, three with separate sewer systems with varying degrees of bypass activity.

STARTING DATE April, 1973 COMPLETION DATE September, 1975

BUDGET CURRENT YEAR $20,000 MAN YEARS 2-1/2

SOURCE OF FUNDS REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT COA OTHER ___

REPORTING PROCEDURE Interim report prepared

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Filamentous Bacteria Control

KEY WORDS Activated Sludge, Control

PRINCIPAL INVESTIGATOR AND AFFILIATION A.C. Smith, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the chemical and process parameters and conditions leading to filamentous bacteria development within the activated sludge process and to evaluate various methods of control.

DESCRIPTION

Laboratory and pilot-scale evaluations are being followed by full-scale treatment trials. A portable laboratory has been constructed for carrying out on-site treatability studies.

STARTING DATE April, 1975 COMPLETION DATE March, 1976

BUDGET CURRENT YEAR $30,000 MAN YEARS 3/4

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT ___; OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Arsenic Precipitation

KEY WORDS Coagulation, Sedimentation, Filtration, Floatation, Alum

PRINCIPAL INVESTIGATOR AND AFFILIATION V. Hraseova, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY				
	INTERNAL	X	UNSOLICITED	MULTI-YEAR
	GRANT		SOLICITED	CONCURRENT

OBJECTIVE

To evaluate various methods of precipitating arsenic from drainage water from a deserted gold mine.

DESCRIPTION

Following a literature review, laboratory jar testing will be carried out to be supported by field pilot studies.

STARTING DATE June, 1975 COMPLETION DATE June, 1976

BUDGET CURRENT YEAR $8,000 MAN YEARS 1/4

SOURCE OF FUNDS							
	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER ___

REPORTING PROCEDURE Report on completion

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Pollution Control DATE June, 1975

PROJECT TITLE Users Manual for Monitoring Techniques

KEY WORDS

PRINCIPAL INVESTIGATOR AND AFFILIATION: G. Zukovs, Wastewater Treatment Section, Pollution Control Branch

LIAISON OFFICER OR SUPERVISOR: S.A. Black, Wastewater Treatment Section, Pollution Control Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To prepare a users manual for monitoring techniques which covers Ontario conditions and equipment and systems readily available on the Ontario market.

DESCRIPTION

Based upon field evaluations of equipment and systems, a manual will provide the necessary theoretical background, system design and installation information in a practical user-oriented manner.

STARTING DATE: August, 1975 COMPLETION DATE: August, 1976

BUDGET CURRENT YEAR: $22,000 MAN YEARS: 3/4

SOURCE OF FUNDS: REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE: Report in August, 1976

REMARKS

RESOURCE

RECOVERY

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Resource Recovery DATE August 29, 1975

PROJECT TITLE Utilization of Plastics Recovered from Municipal Wastes

KEY WORDS Resource Recovery, Plastics

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Leidner, Department of Materials Chemistry, Ontario Research Foundation

LIAISON OFFICER OR SUPERVISOR N.R. Ahlberg, Technology and Market Development Section, Resource Recovery Branch

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED X	CONCURRENT

OBJECTIVE

To investigate processing methods for mixed plastics recovered from municipal wastes; to produce a foam plastic that could be used as a packaging or insulating material; to establish a process that is compatible with existing equipment and technology.

DESCRIPTION

The Ontario Research Foundation has contracted to investigate various processing temperatures, crosslinking agents and blowing agent combinations to produce a plastic foam from mixed plastics recovered from municipal waste.

STARTING DATE June, 1975 COMPLETION DATE March, 1976

BUDGET CURRENT YEAR $17,000 MAN YEARS -

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE Final report to be submitted by March, 1976

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH	Resource Recovery — DATE August 29, 1975
PROJECT TITLE	Experimental Resource Recovery Plant
KEY WORDS	Resource Recovery, Solid Waste Management
PRINCIPAL INVESTIGATOR AND AFFILIATION	N.R. Ahlberg, Technology and Market Development Section, Resource Recovery Branch
LIAISON OFFICER OR SUPERVISOR	B.I. Boyko, Technology and Market Development Section, Resource Recovery Branch

RESEARCH CATEGORY			
INTERNAL GRANT	X	UNSOLICITED SOLICITED	MULTI-YEAR CONCURRENT X

OBJECTIVE

To construct a resource recovery plant to evaluate unit processes for resource recovery; to produce working quantities of recovered materials; to establish markets for recovered resources; to establish costs for resource recovery processes and systems; to provide facilities in which external resource recovery research studies can be conducted.

DESCRIPTION

A 200 ton/day experimental resource recovery plant, also incorporating a 600 ton/day transfer station, is under construction in North York. Unit processes included in this facility are: shredding, air separation, air classification, magnetic separation, screening, composting, compaction, baling, conveying systems, and energy recovery. Recovered materials will include paper, cardboard, ferrous metals, non-ferrous metals, glass, clean paper fibre, organic fibre, and compost.

STARTING DATE	March, 1975	COMPLETION DATE	Plant start-up in August, 1976
BUDGET CURRENT YEAR	$7,000,000	MAN YEARS	-

SOURCE OF FUNDS							
REGULAR WORK PROGRAM	___	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	X	OTHER	___

REPORTING PROCEDURE	Project reports issued through Resource Recovery Branch
REMARKS	Joint project of the Province of Ontario and the Municipality of Metropolitan Toronto

WATER

RESOURCES

BRANCH

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 11, 1975

PROJECT TITLE Ecological Modelling for River Systems

KEY WORDS Rivers, Nutrients, Oxygen, Plants, Modelling

PRINCIPAL INVESTIGATOR AND AFFILIATION A.J. Bebbington

LIAISON OFFICER OR SUPERVISOR D.G. Weatherbe, Water Modelling Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop mathematical models to predict the effects of nutrient inputs on plant and algae growth in rivers and the resulting biomass buildup and effects on the dissolved oxygen regime.

DESCRIPTION

The model will be based on research study underway in the Limnology and Toxicity Section, Water Resources Branch, into nutrient-plant growth-dissolved oxygen interrelationships. The research study was started as part of the Thames River Study in 1972, and continues in the Limnology and Toxicity Section as an in-house project.

STARTING DATE		COMPLETION DATE	On-going
BUDGET CURRENT YEAR	$10,000	MAN YEARS	1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING X	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 11, 1975

PROJECT TITLE Parameter Measurement Techniques for Water Quality Models

KEY WORDS Rivers, Oxygen, Modelling

PRINCIPAL INVESTIGATOR AND AFFILIATION A.J Bebbington

LIAISON OFFICER OR SUPERVISOR D.G. Weatherbe, Water Modelling Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To improve accuracy of models for prediction of dissolved oxygen relationships in rivers by development of direct measurement techniques for sensitive parameters.

DESCRIPTION

Atmospheric aeration and benthic respiration measurement techniques will be investigated, during drainage basin surveys.

STARTING DATE

COMPLETION DATE On-going

BUDGET CURRENT YEAR $10,000

MAN YEARS 1/2

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING X	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE Restricted

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 11, 1975

PROJECT TITLE Development of Stream Water Quality Models

KEY WORDS Rivers, Oxygen, Modelling

PRINCIPAL INVESTIGATOR AND AFFILIATION T.P.H. Gowda
A.J. Bebbington

LIAISON OFFICER OR SUPERVISOR D.G. Weatherbe, Water Modelling Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop new and improve existing stream water quality models used for evaluating the effects of various water management alternatives on water quality. Models are presently used to set waste loading levels in Ontario streams which allow dissolved oxygen criteria to be met and to predict the effect of waste effluent releases under variations in natural or augmented streamflow.

DESCRIPTION

Models are two types: (a) steady state and (b) dynamic simulation.

(a) Steady state dissolved oxygen models will be applied routinely by regional staff to point source waste loading locations.

(b) The dynamic simulation model was developed as part of the Thames River Study. Research will continue while applying the model to the Grand River basin to (1) improve sub-models describing inputs and effluent dispersion, (2) develop interface with other models such as hydrologic models, storm water management models and ecological models, and (3) to include additional water quality parameters.

STARTING DATE

COMPLETION DATE On-going

BUDGET CURRENT YEAR $87,000

MAN YEARS 6

SOURCE OF FUNDS	REGULAR WORK PROGRAM ___	SPECIAL MINISTRY FUNDING X	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Representative Basin and Hydrologic Model Studies

KEY WORDS Ground Water, Quantity, Modelling

PRINCIPAL INVESTIGATOR AND AFFILIATION L.A. Logan) Water Modelling Section,
S.N. Singer) Water Resources Branch

LIAISON OFFICER OR SUPERVISOR F.C. Fleischer, Water Modelling Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To quantify hydrologic index parameters for the evaluation of all phases of the hydrologic cycle as it applies to five selected representative basins, typical of various geologic and physiographic regions in Southern Ontario, and to apply and develop mathematical, hydrologic and hydrogeologic simulation models to aid water resources research and management.

DESCRIPTION

Collection, analysis and interpretation of hydrologic data for general water balance studies; the formation of a computerized hydrologic information system and data base and continuing development and calibration of mathematical hydrologic and hydrogeologic models; establishing physically based functional and empirical relationships between interrelated hydrologic and/or hydrogeologic processes for extrapolation to other similar hydrologic areas in Southern Ontario.

STARTING DATE

COMPLETION DATE On-going

BUDGET CURRENT YEAR $73,000

MAN YEARS 5 1/2

SOURCE OF FUNDS

REGULAR WORK PROGRAM ___

SPECIAL MINISTRY FUNDING X

JOINTLY FUNDED PROJECT ___

OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Great Lakes Water Quality Modelling

KEY WORDS Great Lakes, Water Quality, Modelling

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Polak
B. Kohli

LIAISON OFFICER OR SUPERVISOR M.D. Palmer, Water Modelling Section, Water Resources Branch

RESEARCH CATEGORY INTERNAL X GRANT UNSOLICITED SOLICITED MULTI-YEAR CONCURRENT

OBJECTIVE

To define processes in the near-shore regions of the Great Lakes, such as eutrophication and sedimentation and evaluate some lakewide models.

DESCRIPTION

Data from conventional water quality surveys is combined with some recording meter data and used in a model to determine the mass exchange between coastal and offshore waters and predict dispersion patterns and characteristics.

STARTING DATE COMPLETION DATE On-going

BUDGET CURRENT YEAR $81,000 MAN YEARS 2-1/2

SOURCE OF FUNDS REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT IJC OTHER ___

REPORTING PROCEDURE Restricted

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Ground Water Pollution Studies

KEY WORDS Ground Water, Landfill, Pollution

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Hughes, Hydrology and Monitoring Section, Water Resources Branch

LIAISON OFFICER OR SUPERVISOR Hydrology and Monitoring Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To improve expertise in predicting the migration of ground-water contaminants, as a supplement to consultative activities involving the Pollution Control and Environmental Approvals Branches, and the Regions in the Regional Operations Division.

DESCRIPTION

Studies include assessing sanitary landfill sites, monitoring and sampling (leachate) methodology; examining infiltration rates and subsequent leachate production in landfills; examining methods for the prevention of hydrocarbon damage to ground-water aquifers. Ties in with related studies contracted to the University of Waterloo under the terms of the Canada-Ontario Agreement and to those of the IJC - Pollution from Land Use Activities Reference Group.

STARTING DATE

COMPLETION DATE On-going

BUDGET CURRENT YEAR $20,000

MAN YEARS 1

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources Branch DATE July 10, 1975

PROJECT TITLE Geophysical Technique Studies

KEY WORDS Ground Water, Quantity

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Wong, Hydrology and Monitoring Section, Water Resources Branch

LIAISON OFFICER OR SUPERVISOR Hydrology and Monitoring Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To improve techniques for ground-water resource assessment, using geophysical techniques.

DESCRIPTION

Specialized and innovative geophysical techniques using seismic, resistivity, magnetic and well-logging methods are being employed and tested to aid in the assessment of the Province's ground-water resources.

STARTING DATE

COMPLETION DATE On-going

BUDGET CURRENT YEAR $8,000

MAN YEARS 1/2

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT ___; OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Toxicity of Heavy Metals to Fish

KEY WORDS Fish, Toxicity, Metals

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Craig, Limnology and Toxicity Section, Water Resources Branch

LIAISON OFFICER OR SUPERVISOR G. Craig, Limnology and Toxicity Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To determine the toxic effects of heavy metals to fish in lakes near Sudbury.

DESCRIPTION

A test species (Florida Flagfish) and local species of fish are exposed to heavy metals in the water from local lakes. The results will help in establishing and managing the fishery. If the waters remain or become toxic, then corrective action may be possible.

STARTING DATE 1973 COMPLETION DATE 1978

BUDGET CURRENT YEAR $84,000 MAN YEARS 3-3/4

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT ___; OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Effects of Phosphorus Removal

KEY WORDS Eutrophication, Phosphorus Reduction

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Robinson) Limnology and Toxicity Section,
K. Nicholls) Water Resources Branch

LIAISON OFFICER OR SUPERVISOR G. Robinson, Limnology and Toxicity Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To measure the changes in receiving waters when phosphorus is removed from domestic effluents.

DESCRIPTION

Four areas are under intensive study: Gravenhurst Bay; Midland-Penetang Bays; Bay of Quinte; Lake Erie. Water quality and phytoplankton data are collected.

STARTING DATE	1969	COMPLETION DATE	On-going
BUDGET CURRENT YEAR	$51,000	MAN YEARS	4

SOURCE OF FUNDS: REGULAR WORK PROGRAM X; SPECIAL MINISTRY FUNDING ___; JOINTLY FUNDED PROJECT IJC*; OTHER ___

REPORTING PROCEDURE General

REMARKS *15% internal funding, 85% IJC funding

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Lakeshore Capacity

KEY WORDS Lakes, Development, Capacity Limits

PRINCIPAL INVESTIGATOR AND AFFILIATION P. Dillon
W. Kirchner

LIAISON OFFICER OR SUPERVISOR P. Dillon
W. Kirchner

RESEARCH CATEGORY	INTERNAL X*	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To quantify the effects of lakeshore development on lake water quality.

DESCRIPTION

Several developed and undeveloped lakes are being surveyed to define water quality and nutrient budgets. Changes will be made on the undeveloped lakes to simulate various aspects of development in order to measure the effects on water quality.

STARTING DATE 1975 COMPLETION DATE 1980

BUDGET CURRENT YEAR *$89,000* MAN YEARS 4-1/4

SOURCE OF FUNDS REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER TEIGA

REPORTING PROCEDURE General

REMARKS *Although 3 other aspects are under study by the Laboratory and Ministry of Natural Resources.

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE The Effect of Depressed pH on Brook Trout and Flagfish Reproduction, Growth and Survival

KEY WORDS pH, Fish, Reproduction

PRINCIPAL INVESTIGATOR AND AFFILIATION G.W. Ozburn

LIAISON OFFICER OR SUPERVISOR G.R. Craig, Limnology and Toxicity Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED X	CONCURRENT
	EXTERNAL X		

OBJECTIVE

To determine what levels of depressed pH impair or inhibit Brook Trout reproduction, growth and survival under soft water conditions and correlate those changes with that of Flagfish which are being used as a test species in the MOE Toxicity Laboratories.

DESCRIPTION

Separate breeding communities of Brook Trout and Flagfish are being exposed to pH adjusted water on a continual basis and the parameters of spawning frequency, egg production, hatching success, fry mortality and growth are being compared between species.

STARTING DATE 1974 COMPLETION DATE 1976

BUDGET CURRENT YEAR $36,500 MAN YEARS

SOURCE OF FUNDS	REGULAR WORK PROGRAM	SPECIAL MINISTRY FUNDING	JOINTLY FUNDED PROJECT	OTHER
	X	___	___	___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Standard Reference Toxicant

KEY WORDS Standardization, Fish, Toxicity

PRINCIPAL INVESTIGATOR AND AFFILIATION P. Hunter

LIAISON OFFICER OR SUPERVISOR G. Craig, Limnology and Toxicity Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL	X	UNSOLICITED	MULTI-YEAR
	GRANT		SOLICITED	CONCURRENT

OBJECTIVE

To develop the use of a standard toxicant.

DESCRIPTION

Stocks of test organisms for toxicity studies will be exposed to a toxicant of known effects. The response will be compared to the known effect to ensure the test organisms are of proper quality.

STARTING DATE 1975 COMPLETION DATE 1976

BUDGET CURRENT YEAR $15,000 MAN YEARS 0.4

SOURCE OF FUNDS	REGULAR WORK PROGRAM	X	SPECIAL MINISTRY FUNDING	___	JOINTLY FUNDED PROJECT	___	OTHER	___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Lake Restoration

KEY WORDS Lake, Management, Weed Harvesting, Destratification, Nutrient Inactivation

PRINCIPAL INVESTIGATOR AND AFFILIATION I. Wile
J. Ellis

LIAISON OFFICER OR SUPERVISOR P. Dillon
I. Wile
J. Ellis

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop techniques for reclamation and management of lakes and ponds.
(a) Aquatic weed harvesting
(b) Destratification of lakes
(c) Nutrient Inactivation

DESCRIPTION

(a) Aquatic weeds are removed from a large area of Lake Chemung to improve aesthetics, fishing and to control eutrophication by removing plant nutrients.

(b) Three lakes are under intensive study to determine the effects of destratification on water quality and fish production.

(c) Three ponds are being treated with alum to inactivate phosphorus and reduce algae. Ministry of Natural Resources conduct fishery studies.

STARTING DATE 1971 COMPLETION DATE On-going

BUDGET CURRENT YEAR $92,000 MAN YEARS 10

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE General

REMARKS A joint project with Ministry of Natural Resources

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Stream Studies

KEY WORDS Stream, Nutrients, Plant Growth

PRINCIPAL INVESTIGATOR AND AFFILIATION L. Wong

LIAISON OFFICER OR SUPERVISOR L. Wong
P. Dillon

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To develop and verify models for establishing nutrient concentration guidelines for stream protection. Studies are being conducted on the Thames and Grand Rivers.

DESCRIPTION

The macrophyte stocks and growth rates are evaluated in a variety of streams with various nutrient concentrations. Analysis of plants and water will be combined in the model to establish acceptable and critical loadings to the streams.

STARTING DATE 1973 COMPLETION DATE On-going

BUDGET CURRENT YEAR $94,000 MAN YEARS 5-1/2

SOURCE OF FUNDS: REGULAR WORK PROGRAM X (1/2) SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER Federal Gov't (1/2)

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Aquatic Plant Drying Methods

KEY WORDS Aquatic Plants, Drying

PRINCIPAL INVESTIGATOR AND AFFILIATION J. Pos, University of Guelph

LIAISON OFFICER OR SUPERVISOR I. Wile for the Ministry
J. Pos for University of Guelph

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To develop cheaper methods of drying aquatic plants in preparation for use as animal feed or compost. Work is being done at the University of Guelph.

DESCRIPTION

A variety of drying techniques will be tried including heating and pressing.

STARTING DATE May, 1975 COMPLETION DATE December, 1975

BUDGET CURRENT YEAR $13,000 MAN YEARS

SOURCE OF FUNDS REGULAR WORK PROGRAM X SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT ___ OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Utilization of Aquatic Plants

KEY WORDS Aquatic Weeds, Compost, Animal Feeds

PRINCIPAL INVESTIGATOR AND AFFILIATION Mr. J.H. Neil, Limnos Ltd.

LIAISON OFFICER OR SUPERVISOR Mrs. I. Wile for the Ministry
Limnos Ltd. supervises the contract

RESEARCH CATEGORY	INTERNAL GRANT	UNSOLICITED SOLICITED X	MULTI-YEAR CONCURRENT

OBJECTIVE

To find uses for aquatic plants as animal feed and compost. All work is being done at the University of Guelph.

DESCRIPTION

Aquatic plants are prepared for feeding trials with sheep and chickens. Extensive analyses of the plants are carried out and the conversion rate is determined for the test animals. Compost is prepared and some plants are grown in it to test nutritive value and ultimate economic value.

STARTING DATE May, 1975

COMPLETION DATE December, 1975 - to be renewed pending results

BUDGET CURRENT YEAR $29,500

MAN YEARS

SOURCE OF FUNDS

REGULAR WORK PROGRAM X

SPECIAL MINISTRY FUNDING ___

JOINTLY FUNDED PROJECT ___

OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Toxicity of Pulp and Paper Mill Effluent

KEY WORDS Toxicity, Fish, Pulp, Effluent

PRINCIPAL INVESTIGATOR AND AFFILIATION M. Whittle

LIAISON OFFICER OR SUPERVISOR M. Whittle

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

An Upper Great Lakes project to measure the toxicity

DESCRIPTION

Standard toxicity techniques were applied before and after effluent treatment was established.

STARTING DATE	1974	COMPLETION DATE	1976
BUDGET CURRENT YEAR	$65,000	MAN YEARS	3

SOURCE OF FUNDS: REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT IJC OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Pesticides and Metals in Great Lakes Fish

KEY WORDS Pesticides, Metals, Fish

PRINCIPAL INVESTIGATOR AND AFFILIATION G. Craig, Limnology and Toxicity Section, Water Resources Branch

LIAISON OFFICER OR SUPERVISOR G. Craig, Limnology and Toxicity Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

This is a PLUARG study to determine the effects of pesticides and metals from rivers on fish in Great Lakes.

DESCRIPTION

The project includes data collection and tabulation and collection of more data if required.

STARTING DATE 1975 COMPLETION DATE 1977

BUDGET CURRENT YEAR $20,000 MAN YEARS 1

SOURCE OF FUNDS REGULAR WORK PROGRAM ___ SPECIAL MINISTRY FUNDING ___ JOINTLY FUNDED PROJECT IJC OTHER ___

REPORTING PROCEDURE General

REMARKS

MINISTRY OF THE ENVIRONMENT

RESEARCH AND DEVELOPMENT INVENTORY

BRANCH Water Resources DATE July 10, 1975

PROJECT TITLE Remote Sensing Techniques

KEY WORDS Remote Sensing, Land Use, Geology, Snow Cover

PRINCIPAL INVESTIGATOR AND AFFILIATION R.C. Ostry, Hydrology and Monitoring Section, Water Resources Branch

LIAISON OFFICER OR SUPERVISOR Hydrology and Monitoring Section, Water Resources Branch

RESEARCH CATEGORY	INTERNAL X	UNSOLICITED	MULTI-YEAR
	GRANT	SOLICITED	CONCURRENT

OBJECTIVE

To carry out the development and evaluation of remote sensing techniques as applied to geology, hydrology, and hydrogeology and provide expert guidance in the use of remote sensing techniques.

DESCRIPTION

ERTS-1 Satellite (LANDSAT) and other high altitude imagery allows in pictorial format a view of regional areas of the earth surface. By processing the imagery, various data on land use, geology, soils, hydrology, hydrogeology, sediment, etc. can be obtained and used to provide information to on-going studies on these earth sciences in the Province. As one example, the feasibility of using data from gamma attenuation surveys is being assessed as they relate to snow pack depth and soil moisture. Studies in conjunction with the Ontario Centre for Remote Sensing (OCRS), Canada Centre for Remote Sensing (CCRS), Department of the Environment, McMaster University and Guelph University.

STARTING DATE		COMPLETION DATE	On-going
BUDGET CURRENT YEAR	$20,000	MAN YEARS	1/4

SOURCE OF FUNDS	REGULAR WORK PROGRAM X	SPECIAL MINISTRY FUNDING ___	JOINTLY FUNDED PROJECT ___	OTHER ___

REPORTING PROCEDURE General

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